



Wildlife Services Seeking Solutions Through Research

United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

**National Wildlife
Research Center**



Resolving Wildlife Conflicts With People Through New Technologies

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National Wildlife Research Center Scientists Explore Animal Senses for New Technologies

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research organization devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and acceptable methods, tools, and techniques. Chemists at NWRC modify, adapt, and develop new methods to analyze numerous compounds in order to determine their potential use in wildlife damage management.

Despite considerable demand for nonlethal methods to manage wildlife damage, very few effective chemical repellants and attractants exist for most species. A growing need exists for selective attractants that can be used to deliver pharmaceutical materials, such as vaccines and contraceptives to wildlife. To find these attractants, NWRC is currently investigating the sensory systems in several wildlife species. This research is important not only to the WS program but also to its stakeholders.

In addition, new tests are being developed that will reduce the need for animal testing during the screening phases of repellants and



lures. Other NWRC experiments focus on developing agents that can be applied to certain crops to block or mask the attractiveness of the crops to wildlife. These agents will eliminate the sensory and nutrient rewards normally sought after by wildlife, and hopefully reduce the incentive of wildlife to damage the crops. Due to the nature of research, much of the analytical work will be performed in NWRC's highly specialized chemistry laboratories, which have the technology and equipment to analyze cells at their molecular levels.

Groups Affected By These Problems:

- Agricultural producers
- Wildlife management specialists
- Aquaculture producers

Major Research Accomplishments:

- WS developed an integrated hazing system to reduce the number of birds flying over and landing on ponds.
- WS developed a technique to rapidly screen and identify potential chemical repellants, thereby avoiding the need to test their effectiveness on live animals.

Applying Science and Expertise to Wildlife Challenges

Characterization of Sensory Input—NWRC researchers are refining a method for analyzing specific sensations in rats (a sample mammal) and chickens (a sample bird). An assessment is being made as to whether there are fundamental differences in pain and irritation sensations between birds and mammals. Additionally, NWRC is determining whether rat and chicken cells may be used as model systems for other mammal and bird species.

"Solutions to Problems Depend Upon Knowledge Which Only Research Can Provide"

Bird-specific Anti-sweet and Anti-nutrient Properties—To protect fruit from bird damage, NWRC chemists are developing a substance to mask the sweet properties of sugars that are found in ripened fruit. Similarly, a substance is being developed to act as a fat-blocker for birds that forage on oil-seed crops, such as sunflowers. This substance would eliminate the incentive of birds to feed on the crops. Prototypes will be field tested to determine the effectiveness of these applications in reducing or eliminating the incentive for birds to damage fruit and oil-seed crops.

Bird Repellants—NWRC scientists are screening certain chemical compounds to determine their effectiveness as bird repellants. In addition, a remote-controlled and remote-activated system for bird hazing is being developed to decrease cormorant depredation on catfish farms.

Selected Publications:

- Bryant, B.P., A. Savchenko, L. Clark, and J.R. Mason. 2000. Potential for Cell Culture Techniques as a Wildlife Management Tool for Screening Primary Repellents. *International Biodeterioration and Biodegradation* 45:175-181.
- Mason, R. and L. Clark. 2000. *The Chemical Senses in Birds*. Sturkie's Avian Physiology. Fifth edition. Academic Press: San Diego, CA. pp. 39-56.